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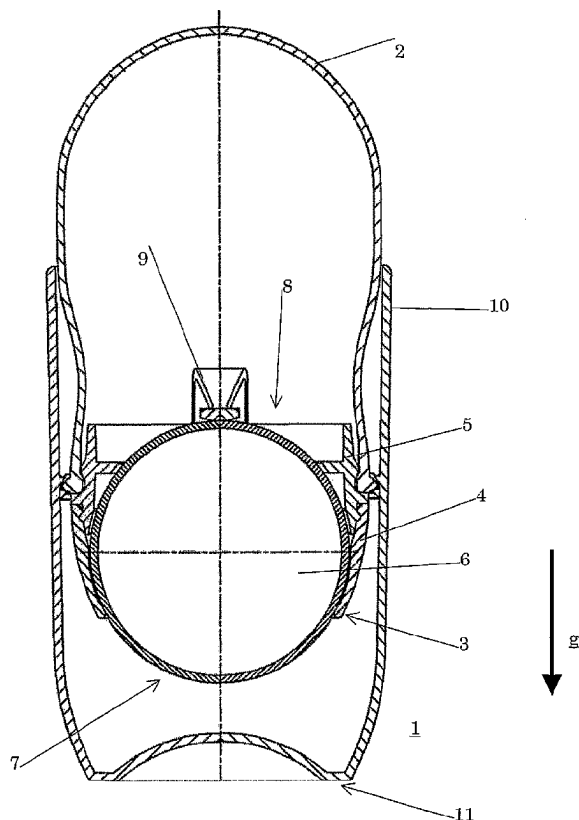
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[Continued on next page]

(54) Title: DISPENSER



(57) Abstract: A dispenser for dispensing viscous liquid, comprising: a container for containing the viscous liquid; a fitting connected with the container; and a roller (6) confined by the fitting and projecting partly therefrom, wherein in operation a slight clearance is present between the fitting and the roller, so that liquid can be taken up from an inwardly directed part of the roller and by rolling can be transported outwards in order to be dispensed. According to the invention, the fitting comprises: a basic part; an apron (4) extending to an outer edge, thereby confining the roller, and being coupled with the basic part; which apron comprises a relatively soft form-following material which follows the contours of the roller; and a biasing (9) element which presses the roller with a predetermined force against the apron.



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Title: Dispenser

The invention relates to a dispenser for dispensing viscous liquid, comprising: a container for containing the viscous liquid; a fitting connected with the container; and a roller confined by the fitting and partly projecting therefrom, wherein in operation a slight clearance is present between the fitting and the roller, so that liquid can be taken up from an inwardly directed part of the roller and by rolling can be transported outwards in order to be dispensed; which fitting comprises: a basic part comprising a relatively stiff, form-giving material; an apron extending to an outer edge, thereby confining the roller, and being coupled with the basic part; which apron comprises a relatively soft form-following material which follows the contours of the roller; and a biasing element which presses the roller with a predetermined force against the apron.

The known dispensers have as a disadvantage that the clearance between roller and fitting that is necessary for transporting the liquid results in unwanted leakage when the dispenser is not in use. GB2215763 shows a dispenser according to the features of the opening paragraph hereof. A disadvantage of the known dispenser is that the apron of the fitting must be manufactured from a relatively stiff material to remain dimensionally stable. As a result, initially an asymmetry can occur adjacent the edges of the apron, so that locally an excess of liquid is dispensed. The stiffness results in a clearance between apron and roller, so that the apron cannot serve as permanent seal. The above-mentioned circumstances have as an additional disadvantage that a large part of the surface of the roller dries up when the dispenser is not used, so that it often takes some time, and the roller needs to be rolled a few times, before the release of the liquid recommences. This is a drawback regarding the user-friendliness of the dispenser. The object of the invention is to obviate the disadvantages of the prior art described and to provide a dispenser which does not entail leakage

when it is not used and which is immediately ready for use in that the roller has not dried up.

These advantages are achieved by a dispenser of the type mentioned in the opening paragraph hereof, wherein the dispenser comprises a sealing edge provided on the apron, which comprises a rubberlike conforming material, the dispenser comprising a spherical top for promoting the liquid in upstanding position having a continuous contact with the sealing edge. It is noted that United States patent specification US5897267 discloses a flexible fitting where such a flexible sealing edge is proposed. However, the patent specification does not solve the disadvantages described because the roller is pressed into the fitting during assembly. This can result in a permanent deformation of the fitting, so that it can no longer close off leak-tightly.

Through a dispenser according to the invention, by the use of the relatively soft material, a leak-tight closure can be provided by the apron. Due to the fitting being built up from separate parts, the apron cannot get permanently deformed during assembly. The spherical top renders it impossible to place the dispenser the wrong way up and this promotes the liquid remaining in continuous contact with the sealing edge. As a result, the roller does not dry up, so that continuous dispensing remains ensured. On the other hand, the shape of the apron is determined by the basic part and in that the roller during non-use abuts permanently against the apron. As a result, no asymmetries in the circumferential edge between apron and roller can occur, so that the closure is perfect. Further, according to the invention, the disadvantage is obviated that the roller through varying forces of a user is depressed and deforms against the basic element so that the roller loses its favorable shape. The biasing element provides a permanent force against the roller, which can be tuned so that, also after a longer time, pressure on the same part of the roller does not result in any deformations of the roller. Due to the construction according to the

invention, a sealing can be formed adjacent the edge of the apron, so that the part of the roller covered by the apron remains wetted by the viscous liquid and the roller is directly ready for use. In particular, this makes it possible to place the dispenser in an orientation with the roller directed downwards, so that the roller is permanently wetted without the container draining by leakage.

According to a preferred embodiment, the biasing element comprises a resilient arm connected with the basic part and being in contact with the roller. The basic part and the resilient arm are formed as one whole. In this way, a central element is formed which engages an inwardly directed part of the roller, which on the one hand contributes to the dimensional stability of the apron and on the other hand presses the roller into the apron.

Although the roller can be cylindrical, in the preferred embodiment the roller has a spherical shape and is manufactured from a stiff material. Through this combination of a stiff, dimensionally stable sphere and a soft, form-following apron, a very good sealing can be provided.

The apron can comprise a sealing edge and capillary grooves extending towards the sealing edge. Such grooves promote the flow of the liquid over the surface of the roller, so that a large part of the surface of the roller is continuously wetted.

Further, the dispenser preferably has a detachable closing cap for covering the roller, with a space being present between the roller and the cap at all times. As a result, the cap does not press on the roller, so that the roller can retain its shape.

In an embodiment, the apron is made of low density polyethylene, of polypropylene or of a flexible polypropylene, which is a relatively soft material. The basic part and/or the roller can be manufactured from polypropylene. In a preferred embodiment, the apron comprises a stiff wall, for instance made of polypropylene, and, provided thereon, a sealing edge from a sealing material such as TPE.

In a still further embodiment, the dispenser comprises a closing cap for closing off the roller, with the cap comprising a base to place the dispenser with an orientation with the roller directed downwards.

The invention will be further elucidated with reference to the
5 drawing, in which:

Fig. 1 shows a schematic view in cross section of the dispenser according to the invention;

Fig. 2 shows a schematic perspective view of the basic part and biasing element according to the invention; and

10 Fig. 3 shows a schematic perspective view of the apron according to the invention.

In the figures, the same parts are designated by the same reference numerals.

15 Fig. 1 shows a schematic view in cross section of the dispenser 1 according to the invention. The dispenser 1 comprises a container 2 for containing viscous liquid, such as a deodorant or a care lotion or the like. An apron 4 extending to an edge 3 is coupled with a rigid cylindrical wall 5, so that the wall 5 and the apron 4 form a fitting in which roller 6 is confined.
20 The roller 6 possesses a spherical shape and is manufactured from a stiff material such as polypropylene (PP). The apron consists of a relatively soft material, for instance of low density polyethylene (LDPE), which follows the contours of the roller. The roller 6 projects partly from the apron 4. In use, the projecting part 7 of the roller can be rolled over a surface, such as, for
25 instance, an armpit or the like, so that the deodorant or other liquid present in the container 2 is dispensed to that surface. To that end, a slight clearance (not shown) is present between the apron 4 and the roller 6, so that liquid can be taken up from an inwardly directed part 8 of the roller 6 and by rolling can be transported outwards in order to be dispensed.

In the dispenser 1, a biasing element in the form of a resilient arm 9 is present, which presses the roller 6 with a predetermined force against the apron 4. The biasing element provides a permanent force against the roller, which can be tuned, so that, also after a longer time, pressure on the same part of the roller does not result in any deformations of the roller. In this exemplary embodiment, the arm is coupled with the wall 5. In use, the roller can be moved, against the pressure of the arm 9, away from the apron 4, resulting in a slight clearance between the apron 4 and the roller 6. As a result, the liquid can easily be moved past the apron 4 to the freely projecting portion 7 of the roller 6, so that it can reach the surface (not shown), such as an armpit, that is to be wetted. Fig. 1 further shows a detachable closing cap 10 which can be fitted over the container 2, for covering the roller 6. The cap 10 can be removed from the container by way of a snap connection, a bayonet catch or screw closure and merely serves to protect the roller. The cap does not make contact with the roller 6. The cap has a flattened side 11 which forms a base to place the dispenser in an orientation with the roller directed downwards, the direction of gravity being indicated with the arrow g.

Fig. 2 shows a schematic perspective view of the basic part 12. This basic part is integral with the biasing elements 9 for pressing the roller 6 against the apron 4. The basic part 5 comprises the cylindrical wall 5, on which, as represented by Fig. 1, the apron can be fixed. As a result, the advantageous flexible properties of the apron, by virtue of which, in combination with the relatively stiff roller 6, a proper sealing of the liquid in the container 2 can take place, are combined with a proper measure of form retention of the apron in that this form is dictated by the wall 5. Further, the basic part 5 according to this embodiment is provided with bent resilient star-shaped arms 9, which have a common point of contact 13 in the center of the roller, so that the roller is pressed into the apron 4 uniformly

throughout the circumferential edge (represented by arrow P) and a liquid seal adjacent the edge of the apron 4 is formed.

Fig. 3, finally, shows a schematic perspective view of the apron 4. The apron is made of a flexible, conforming material such as low density polyethylene (LDPE). The inner wall 14 of the apron 4 follows a generally spherical line, whose radius can differ slightly with respect to the roller included therein, in order to create a wedge-shaped space between them which is bounded by sealing edge 15. In the inner wall 14, grooves 16 extending in the axial direction of the apron are provided, of which the number and the dimensions are tailored to the viscosity of the liquid to be applied by the dispenser. The grooves terminate adjacent the sealing edge 15. The sealing edge 15 can be manufactured from a separate material, for instance a rubberlike, flexible material such as TPE (a thermoplastic polymer), which can be applied, for instance, through so-called bi-injection. The grooves promote the transport of the liquid along the inner wall and ensure that the sphere remains moist as far as a point adjacent the sealing edge, also after not having been used for a longer time. This enhances user convenience.

The invention has been elucidated with reference to the exemplary embodiments represented in the drawing. It will be clear to the skilled person that the invention is not limited thereto but can also encompass variations and modifications without deviating from the spirit of the invention. These variations can comprise the roller being cylinder-shaped instead of spherical. Further, container and fitting may be loose elements but may also be composed as a single piece. Such variations are understood to fall within the scope of the invention as defined in the following claims.

CLAIMS

1. A dispenser for dispensing viscous liquid, comprising:
 - a container for containing the viscous liquid;
 - a fitting connected with the container; and
 - a roller confined by the fitting and projecting partly therefrom,
- 5 wherein in operation a slight clearance is present between the fitting and the roller, so that liquid can be taken up from an inwardly directed part of the roller and by rolling can be transported outwards in order to be dispensed; which fitting comprises:
 - a basic part which comprises a relatively stiff, form-giving material;
 - 10 - an apron extending to an outer edge, thereby confining the roller, and being coupled with the basic part; which apron comprises a relatively soft form-following material which follows the contours of the roller;
 - a biasing element which presses the roller with a predetermined force against the apron;
- 15 characterized in that
 - the dispenser comprises a sealing edge provided on the apron, which comprises a rubberlike conforming material, the dispenser comprising a spherical top for promoting the liquid in upstanding position having a continuous contact with the sealing edge.
- 20
2. A dispenser according to claim 1, characterized in that the biasing element comprises a resilient arm connected with the basic part and being in contact with the roller.
- 25 3. A dispenser according to claim 2, characterized in that the basic part and the resilient arm are formed as one whole.

4. A dispenser according to at least one of the preceding claims, characterized in that the roller has a spherical shape and is manufactured from a stiff material.

5 5. A dispenser according to at least one of the preceding claims, characterized in that the apron comprises capillary grooves extending towards the sealing edge.

6. A dispenser according to at least one of the preceding claims, wherein
10 the dispenser comprises a detachable closing cap for covering the roller, with a space present between the roller and the cap.

7. A dispenser according to at least one of the preceding claims, characterized in that the apron comprises a stiff wall and a sealing edge of a
15 sealing material.

8. A dispenser according to claim 7, characterized in that the stiff wall is of polypropylene, and the sealing edge is of a thermoplastic polymer, in particular TPE.
20

9. A dispenser according to at least one of the preceding claims, characterized in that the apron is made of low density polyethylene, of polypropylene or of a flexible polypropylene.

25 10. A dispenser according to at least one of the preceding claims, characterized in that the basic part is made of polypropylene.

11. A dispenser according to at least one of the preceding claims, characterized in that the dispenser comprises a closing cap for closing off the

roller, the cap comprising a base to place the dispenser in an orientation with the roller directed downwards.

Fig 1

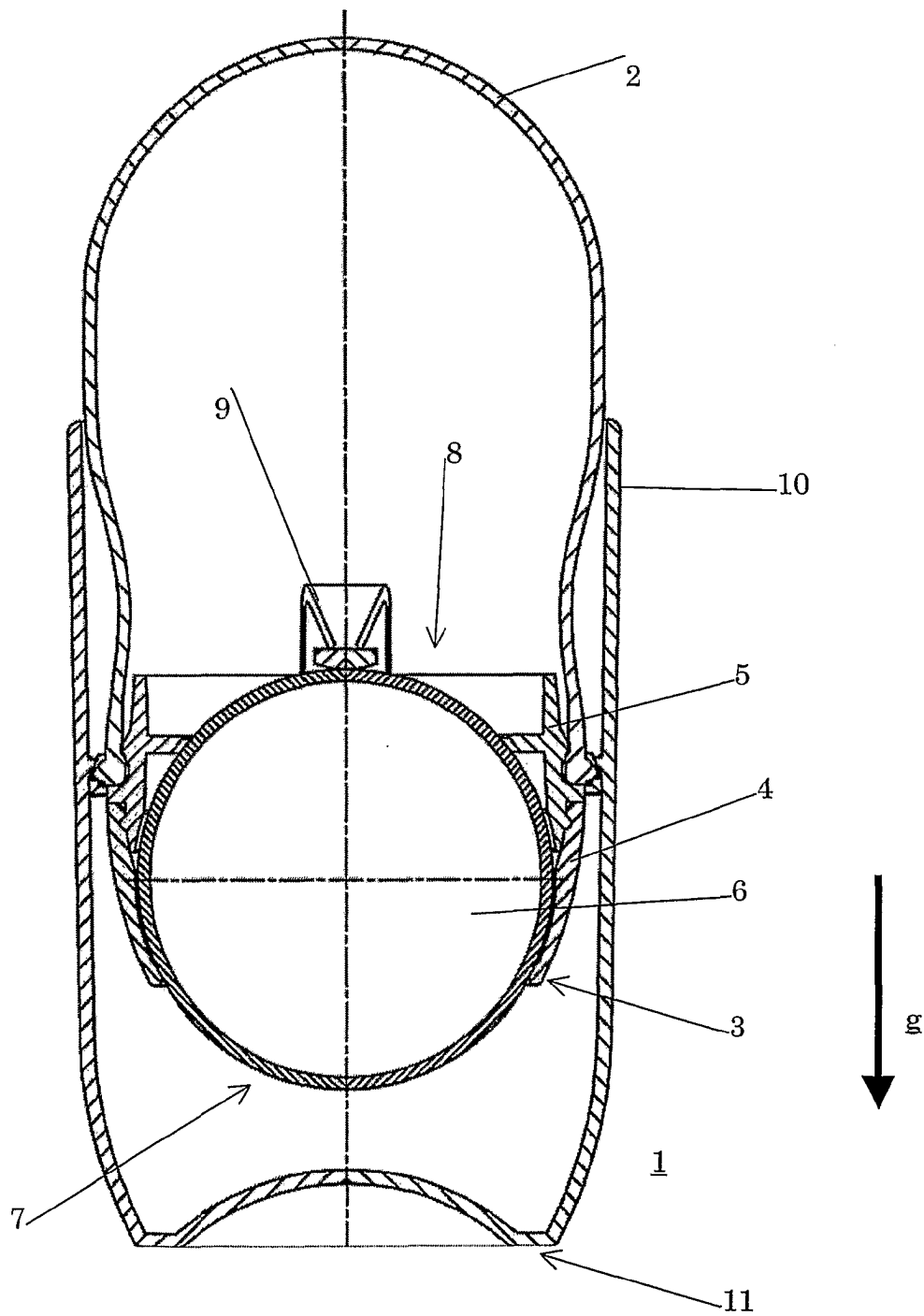


Fig 2

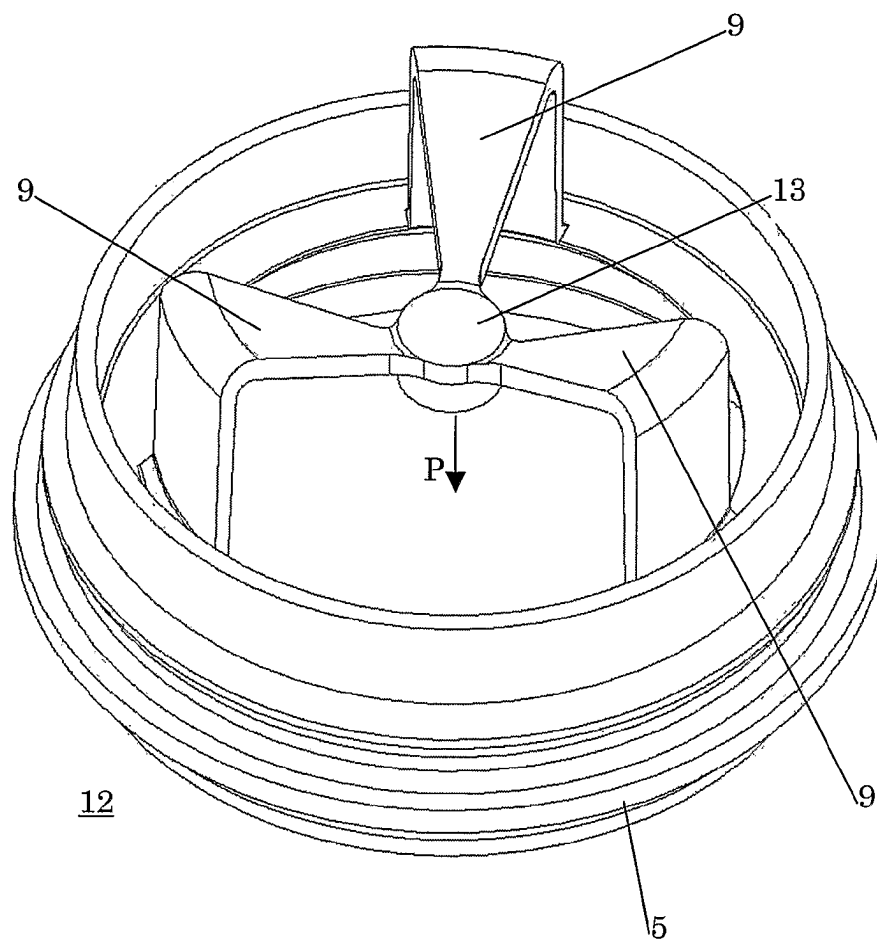
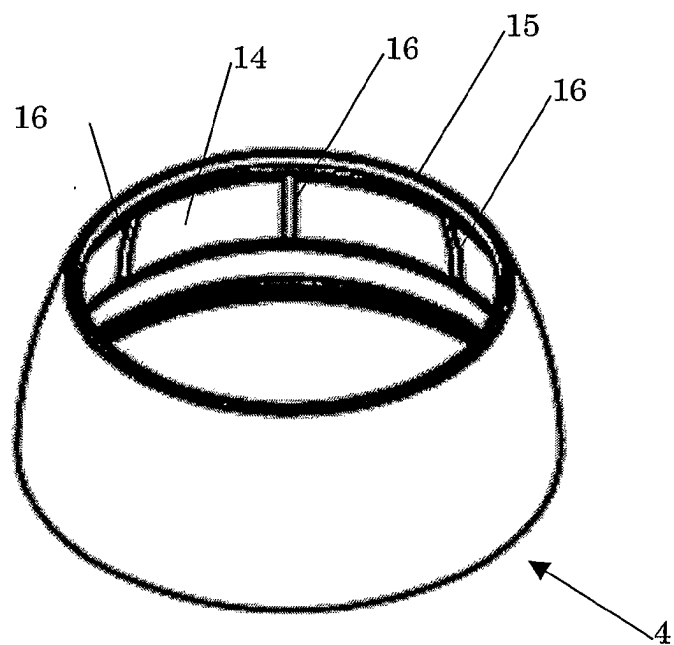


Fig 3



A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A45D34/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A45D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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